



Electromechanical Actuators
Yet-Ming Chiang et al.
Serial No.: 10/635,240
Docket No.: M0925.70138US00

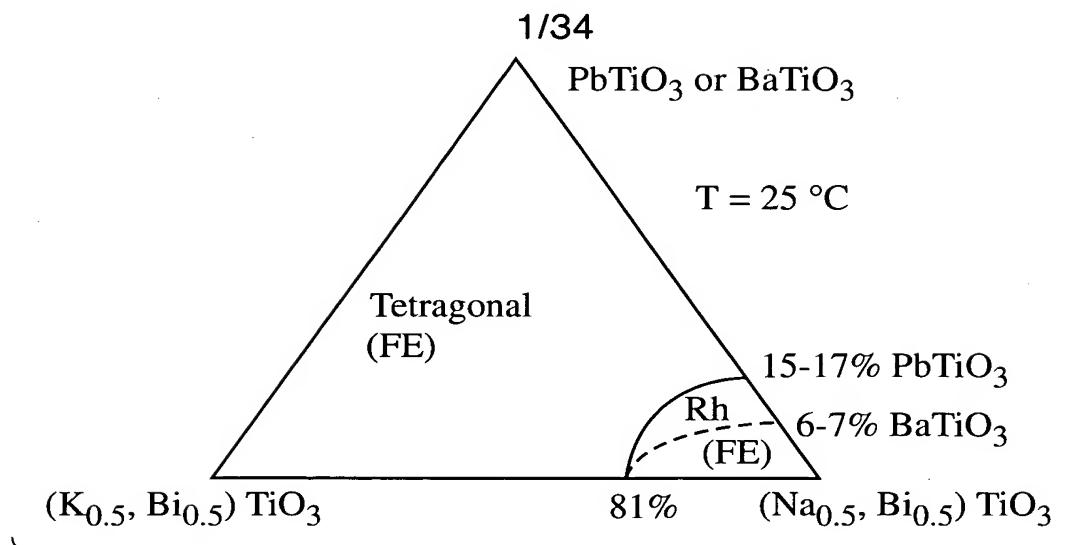


Fig. 1

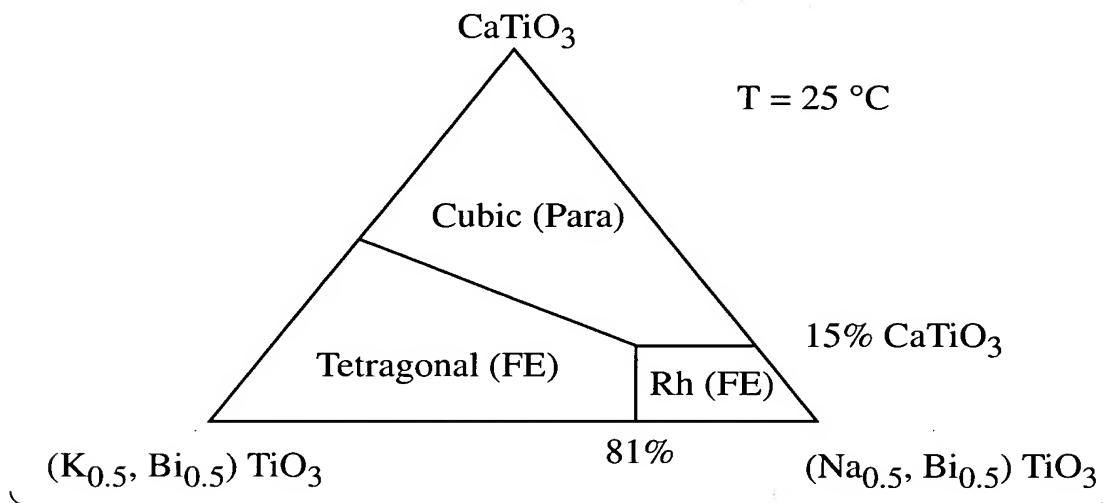


Fig. 2

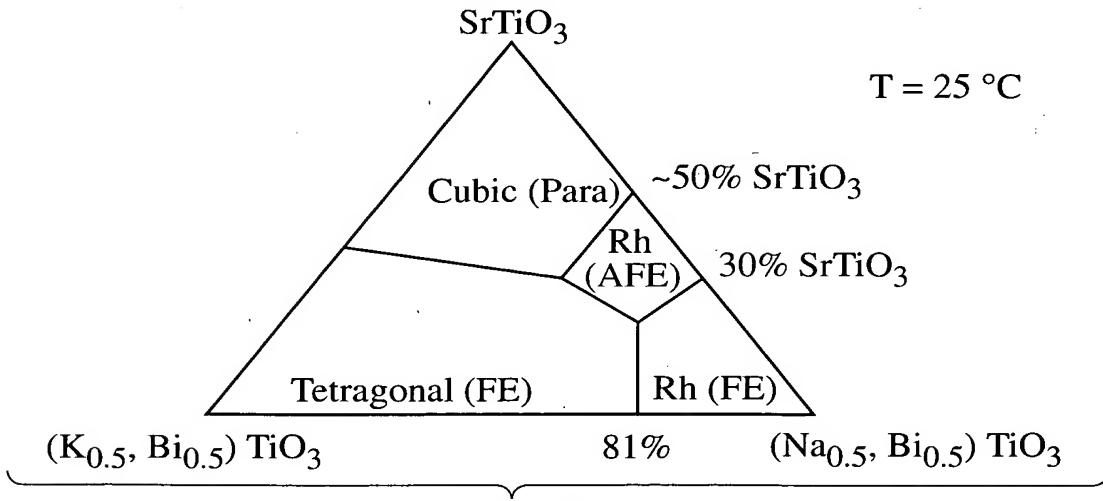


Fig. 3

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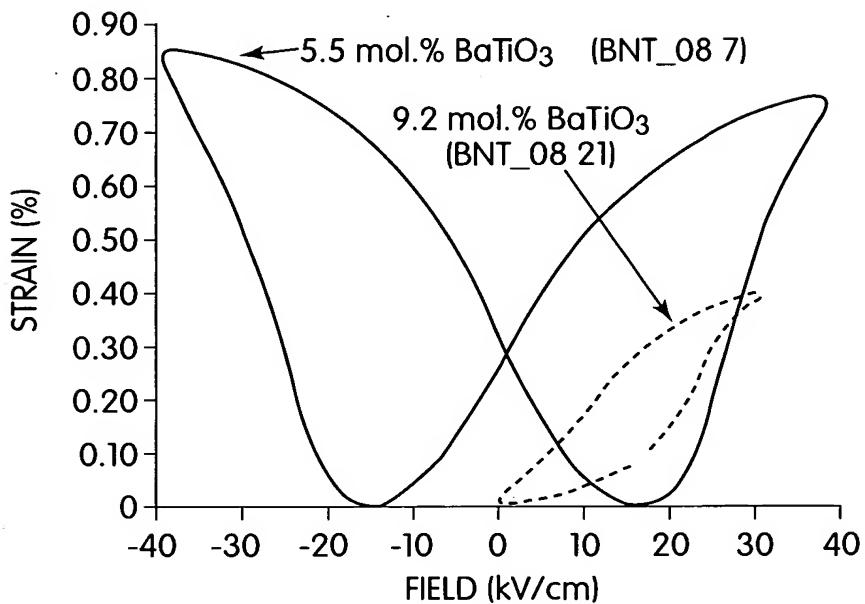


Fig. 4

- 9.2 mol.% BaTiO₃ Tetragonal
- ▲ 5.5 mol.% BaTiO₃ Rhombohedral

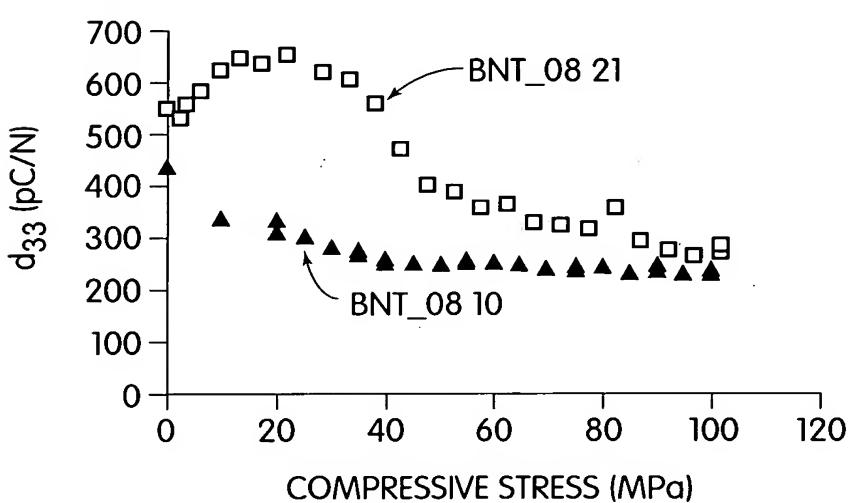


Fig. 5

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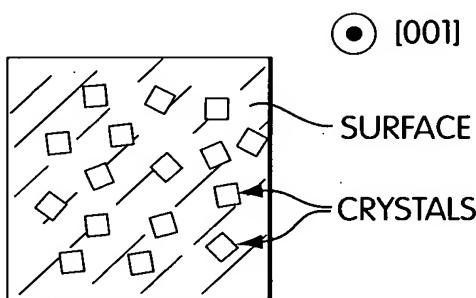


Fig. 6A

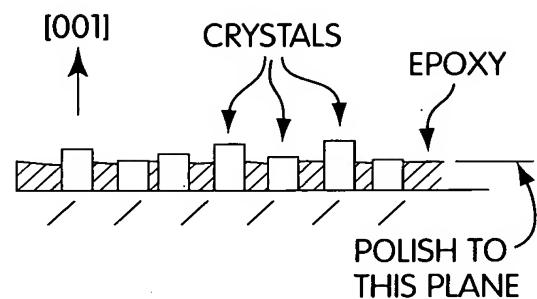


Fig. 6B

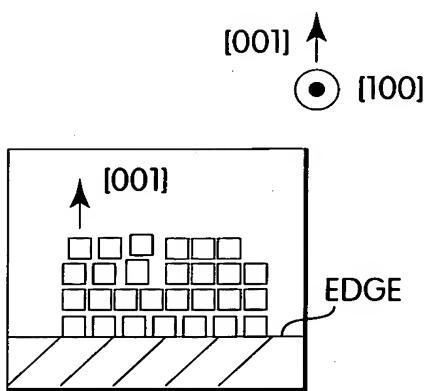


Fig. 7A

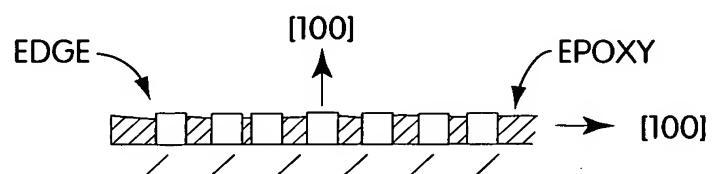


Fig. 7B

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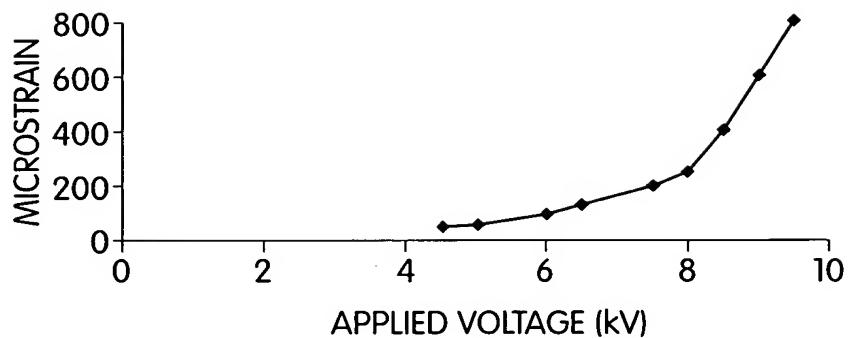


Fig. 8

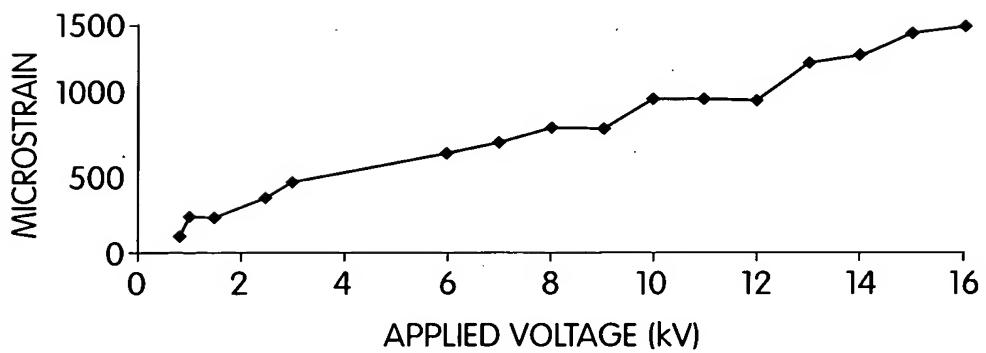


Fig. 9

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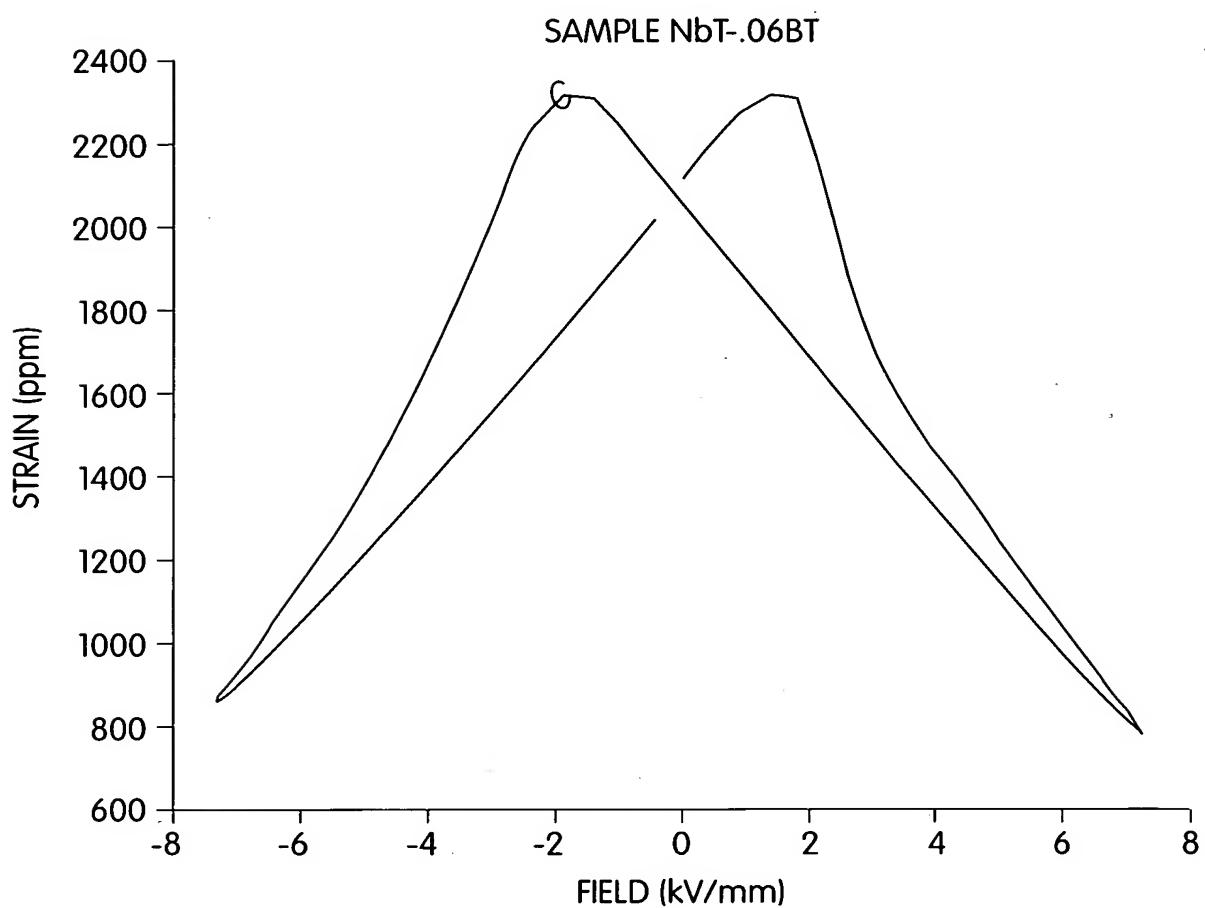


Fig. 10

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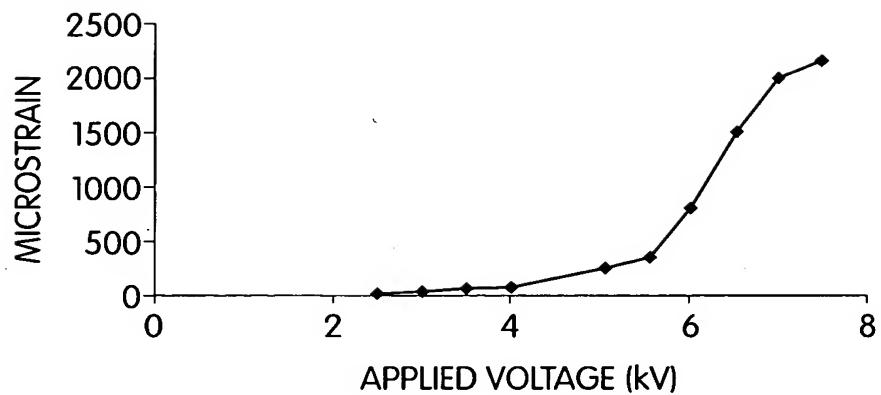


Fig. 11

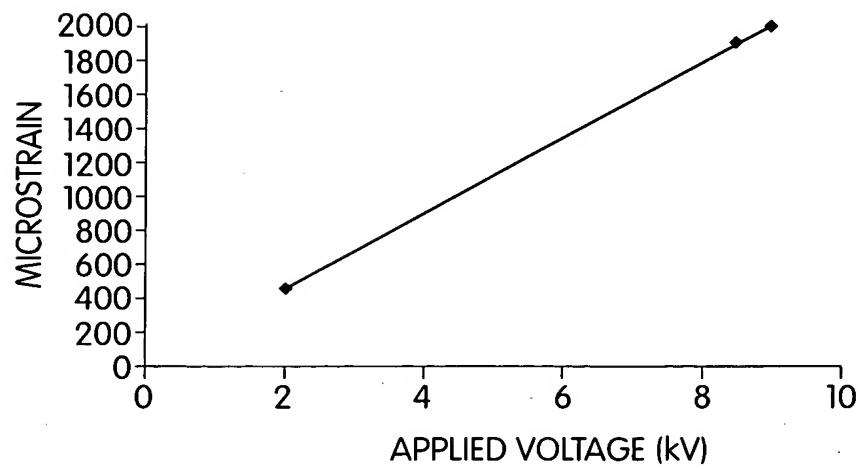


Fig. 12

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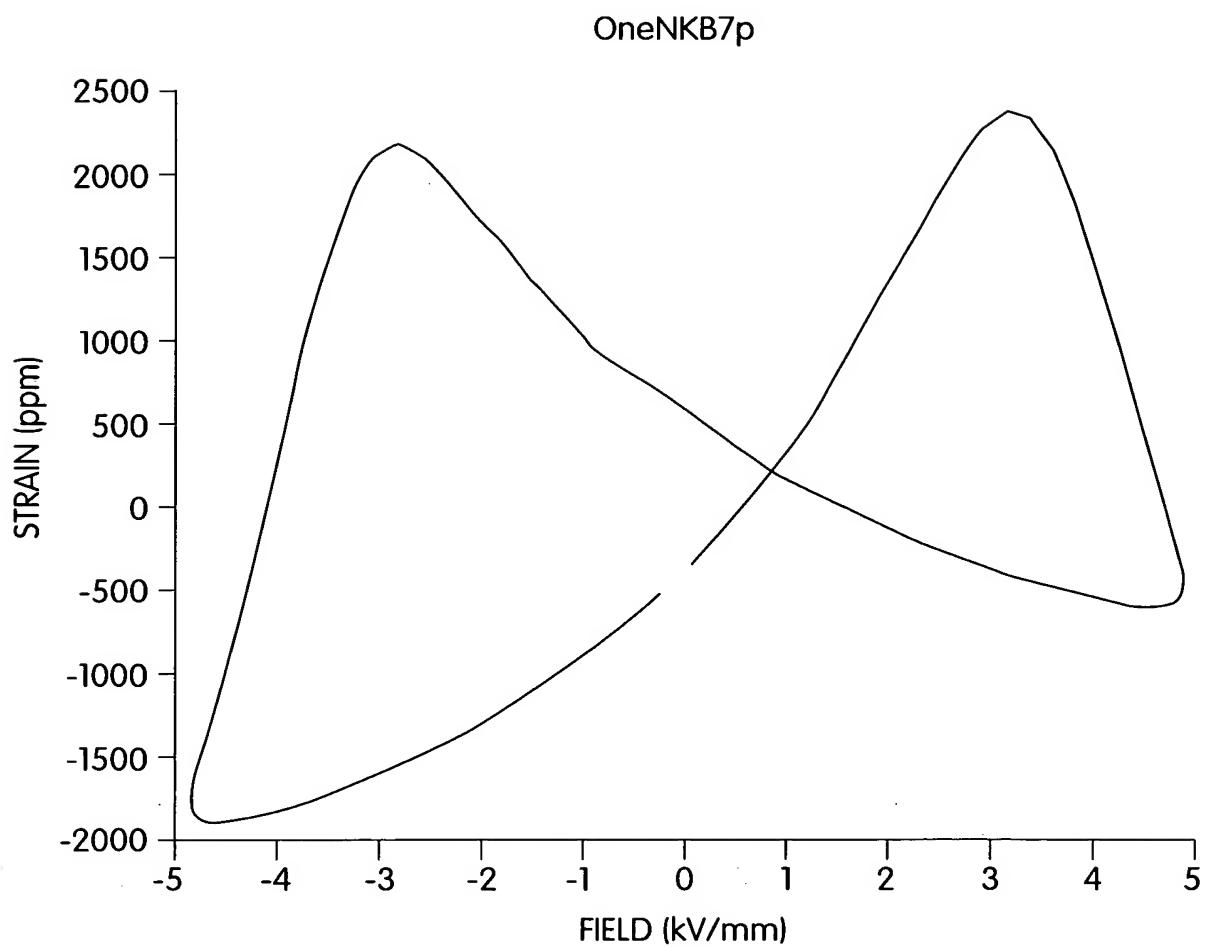


Fig. 13

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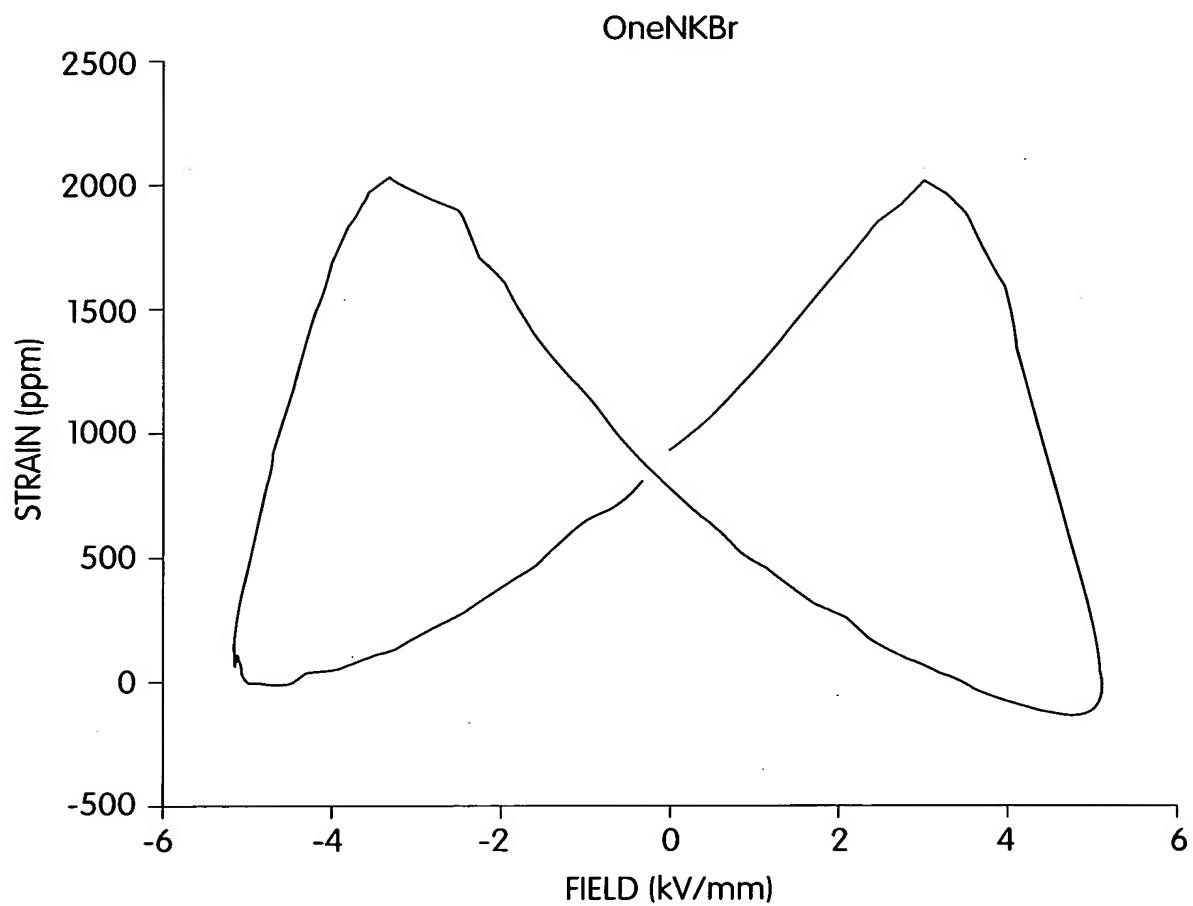


Fig. 14

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TEXTURED SAMPLE

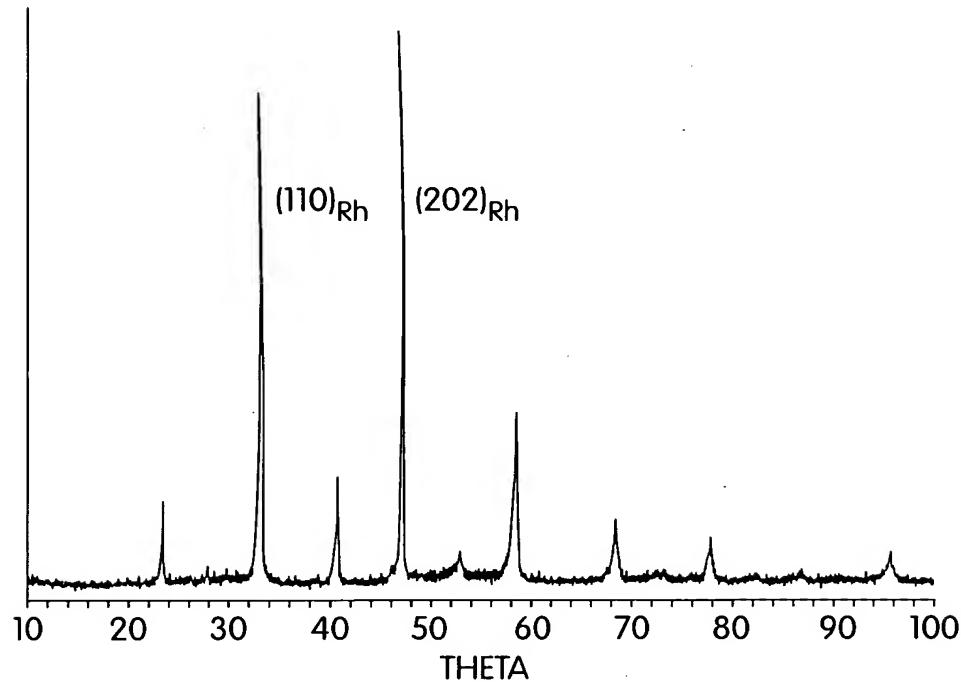


Fig. 15A

RANDOMLY ORIENTED POLYCRYSTAL

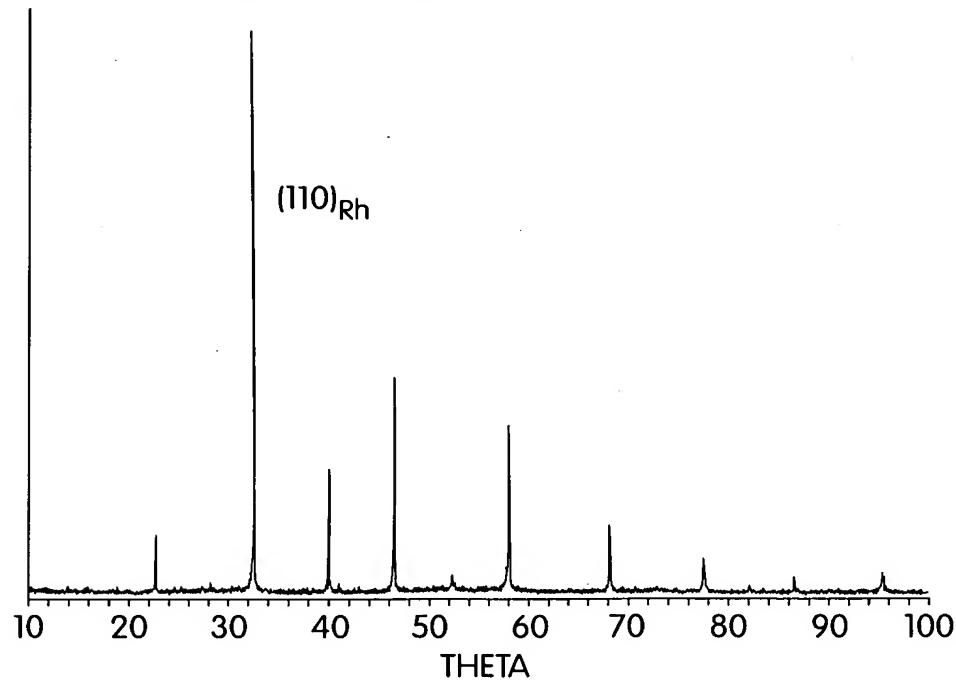


Fig. 15B

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Fig. 16

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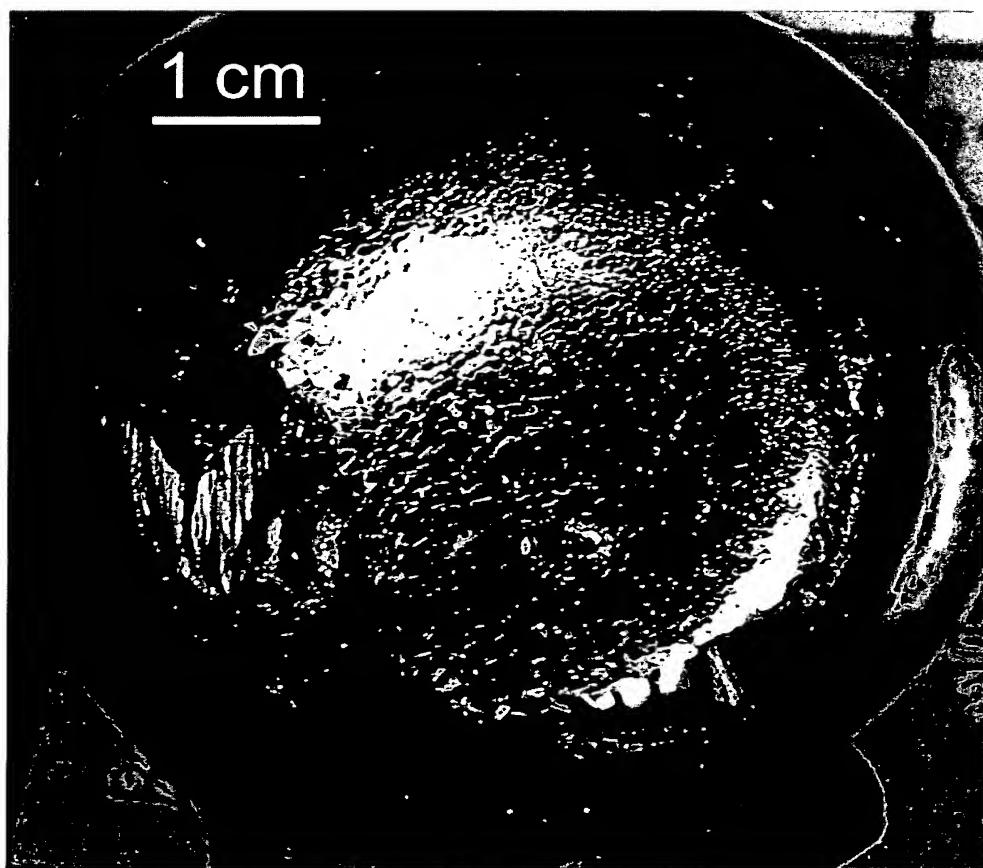


Fig. 17

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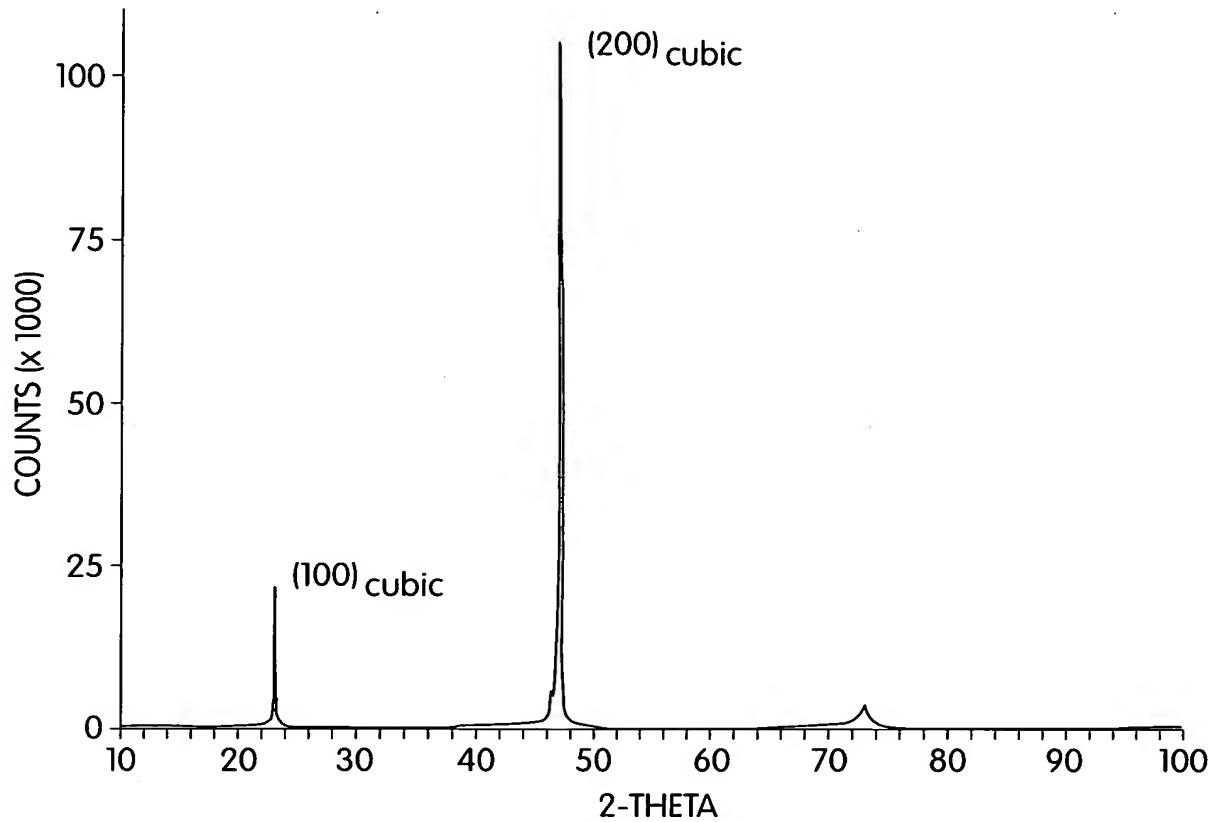


Fig. 18



Fig. 19

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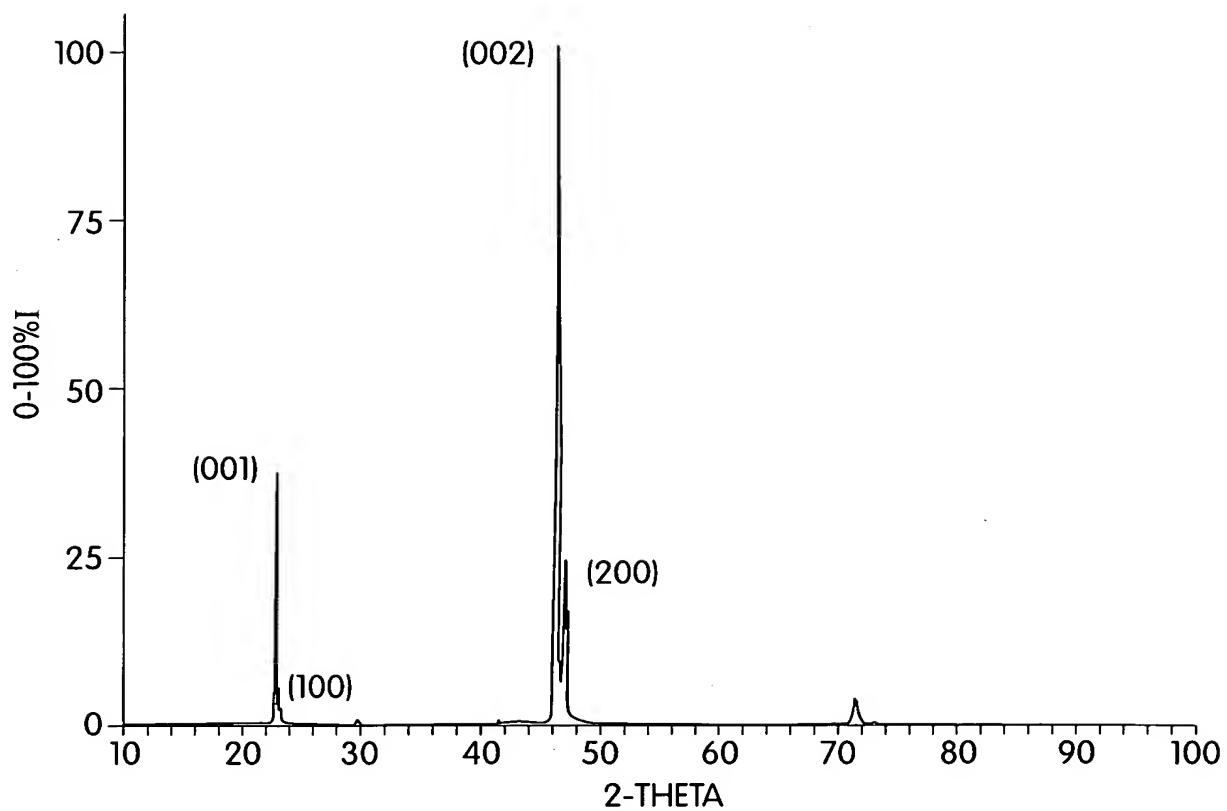


Fig. 20

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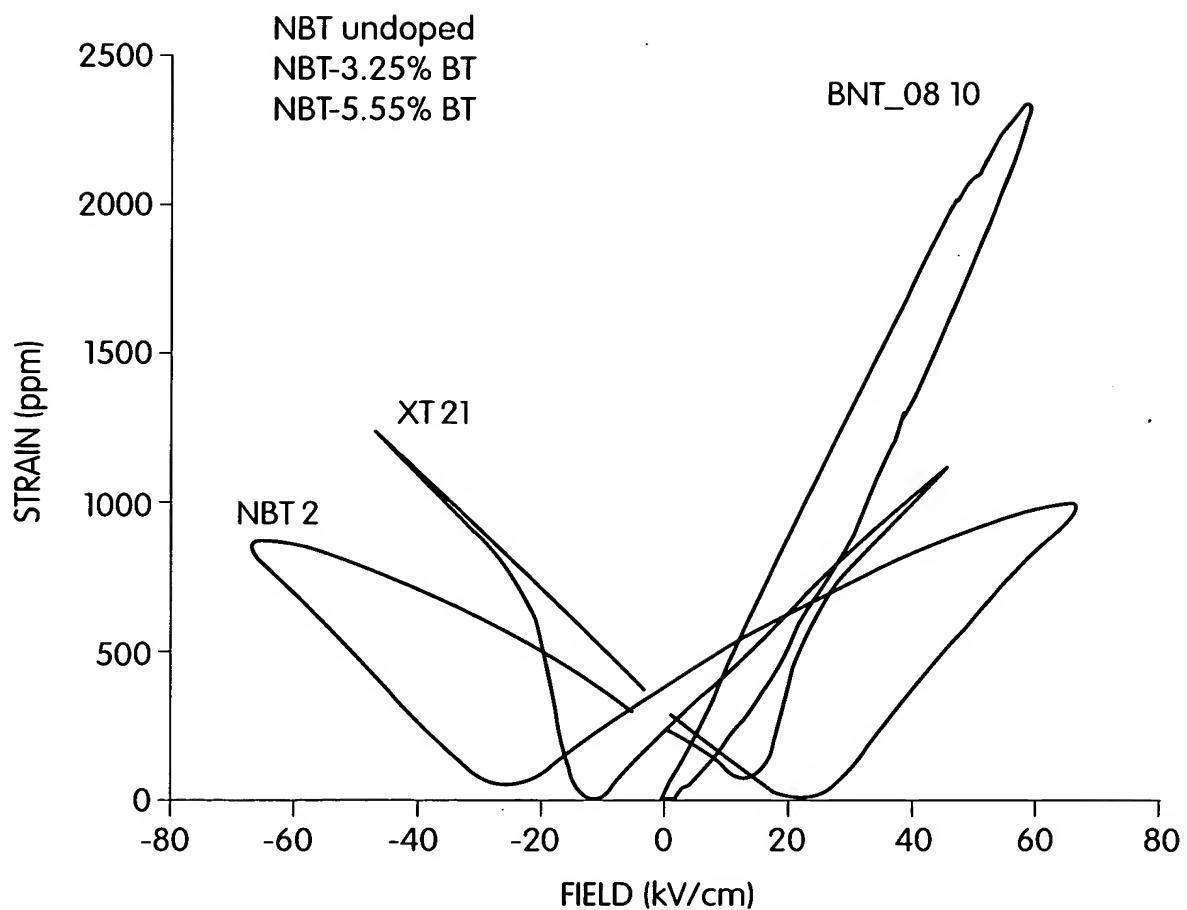


Fig. 21

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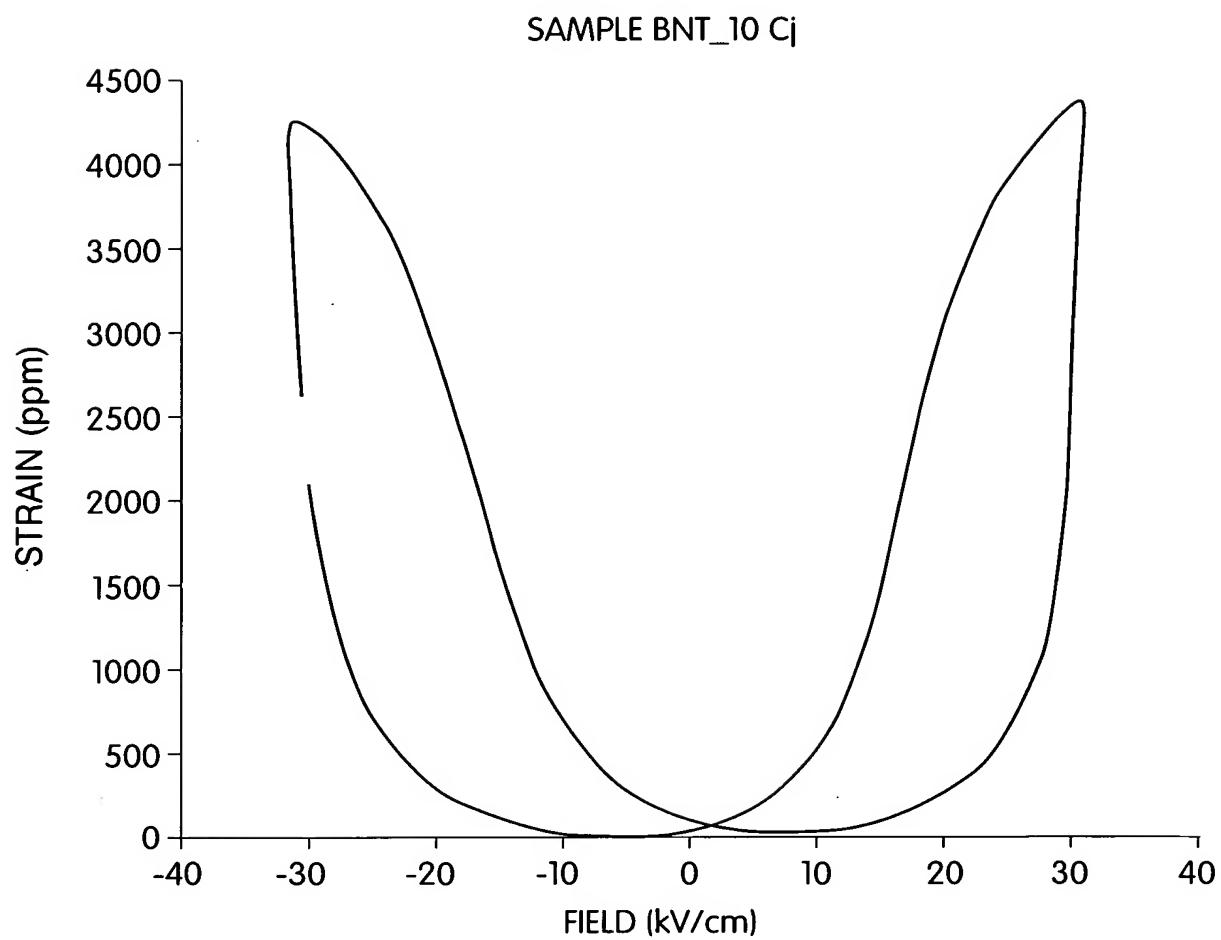


Fig. 22

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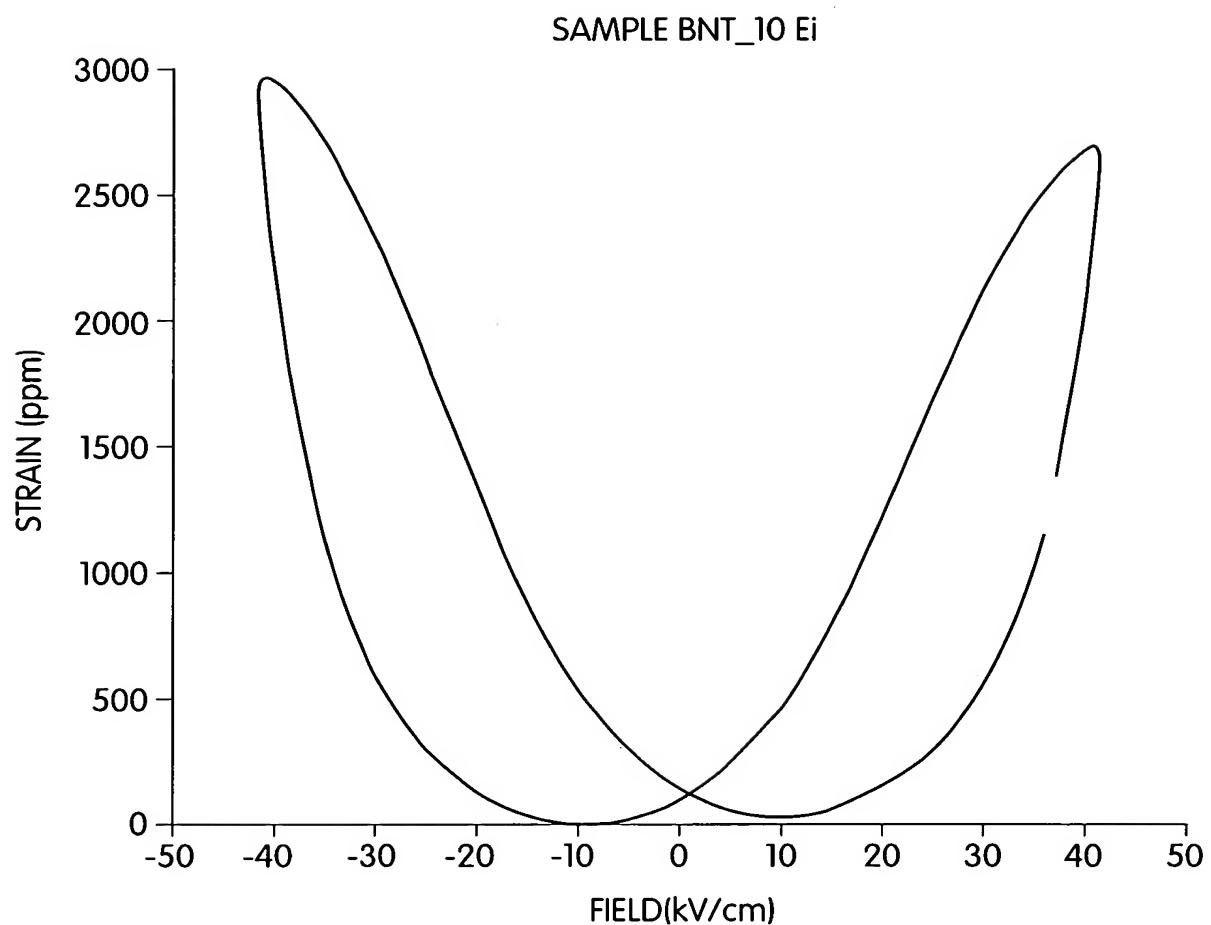


Fig. 23

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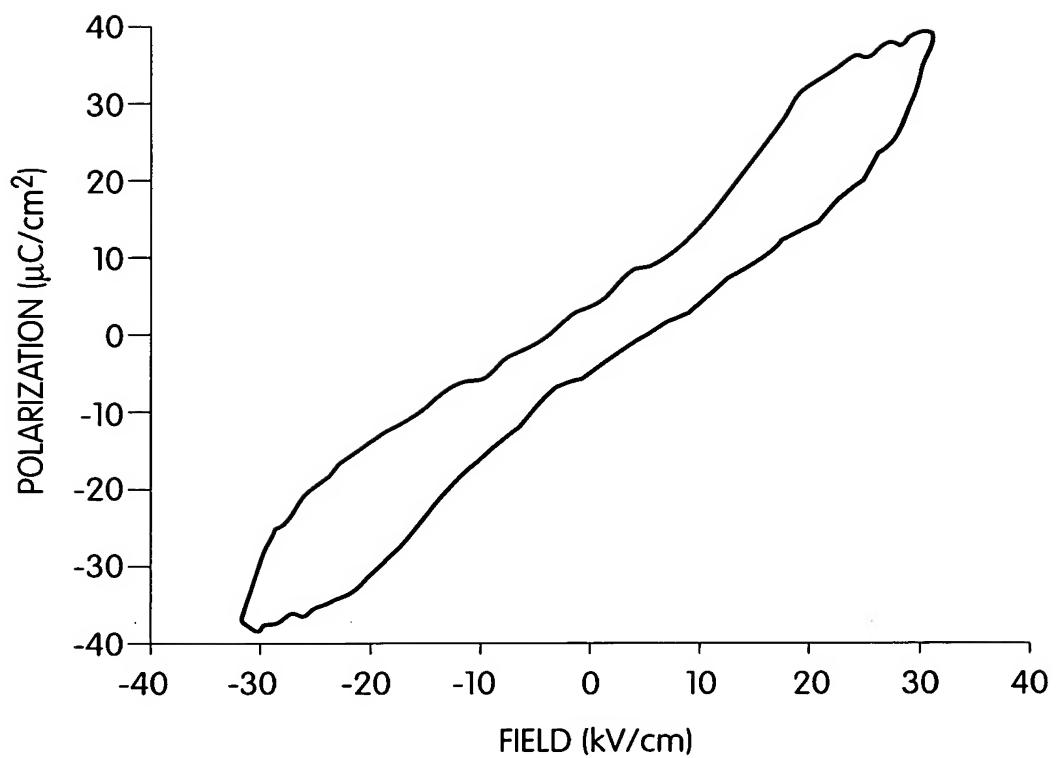


Fig. 24

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Fig. 25

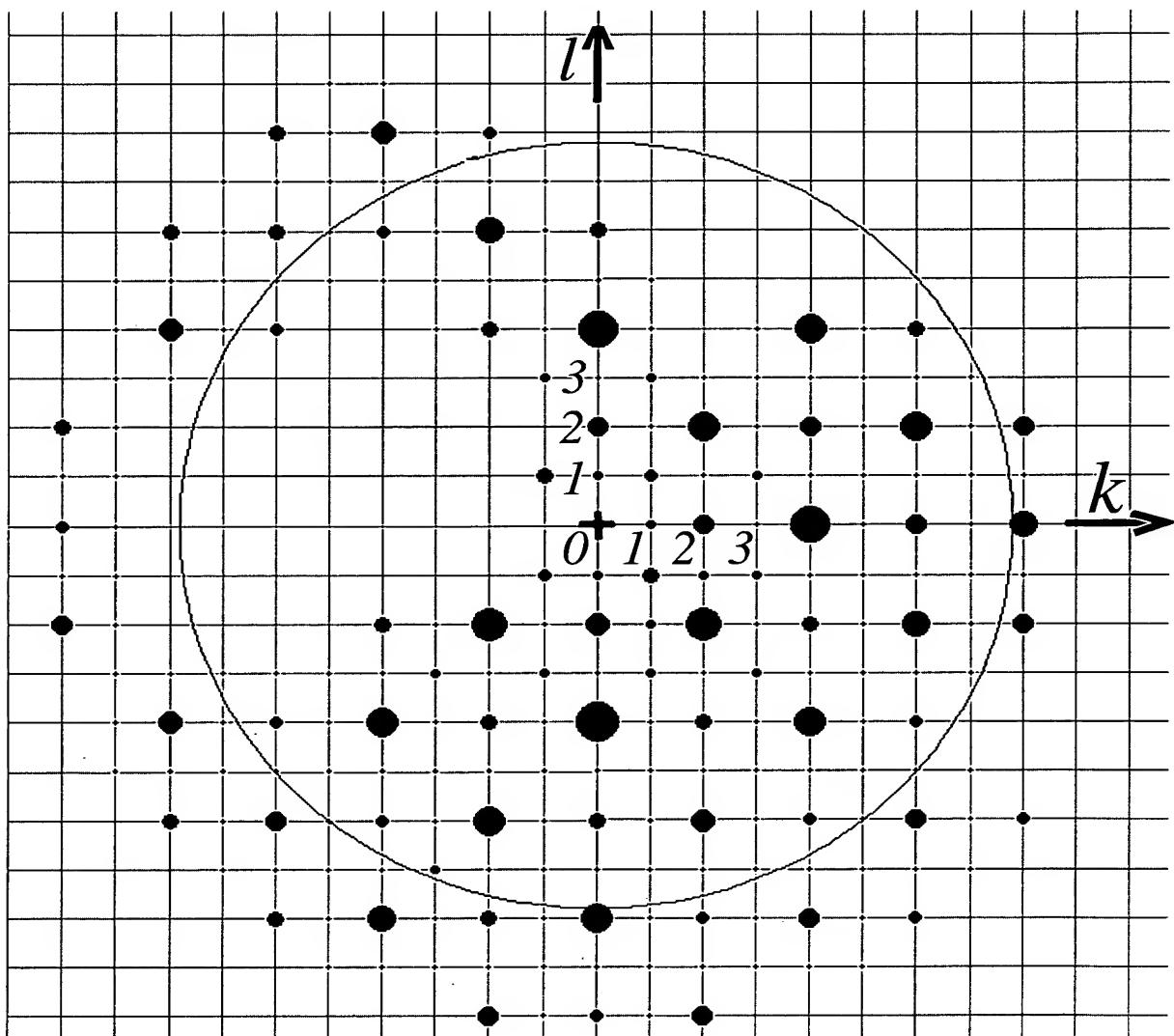


Fig. 26

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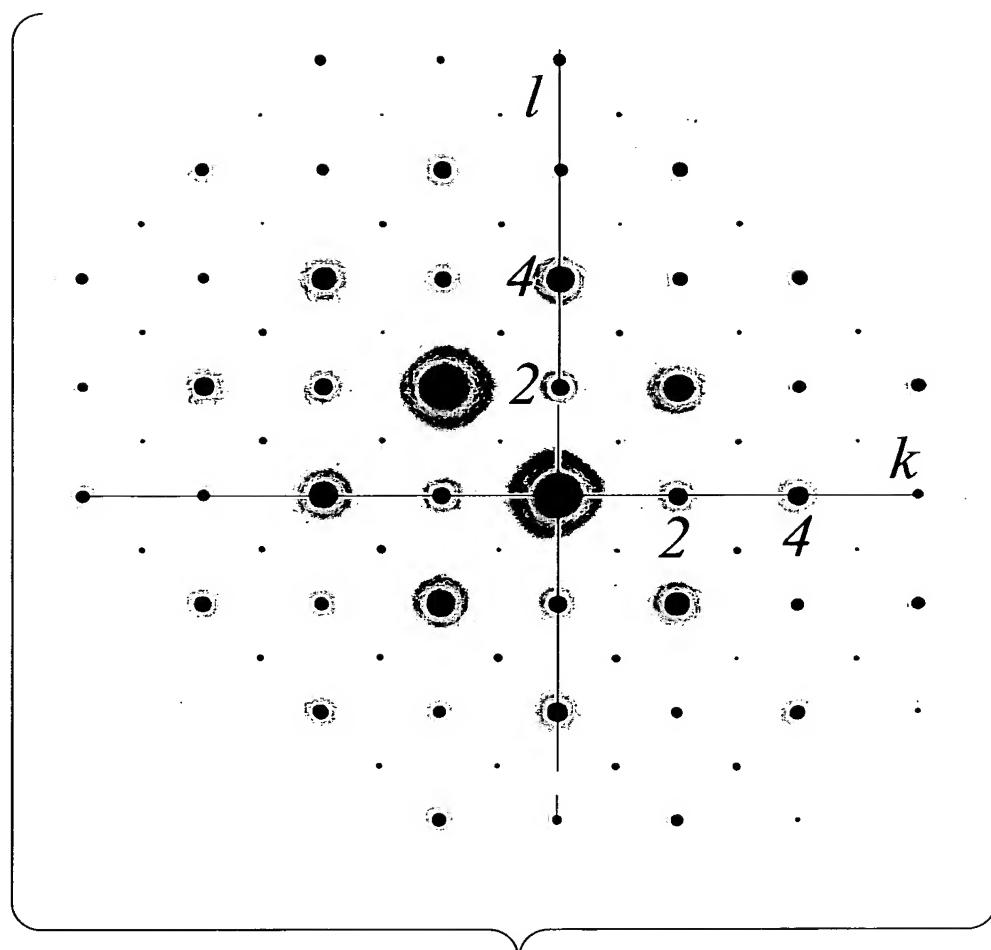
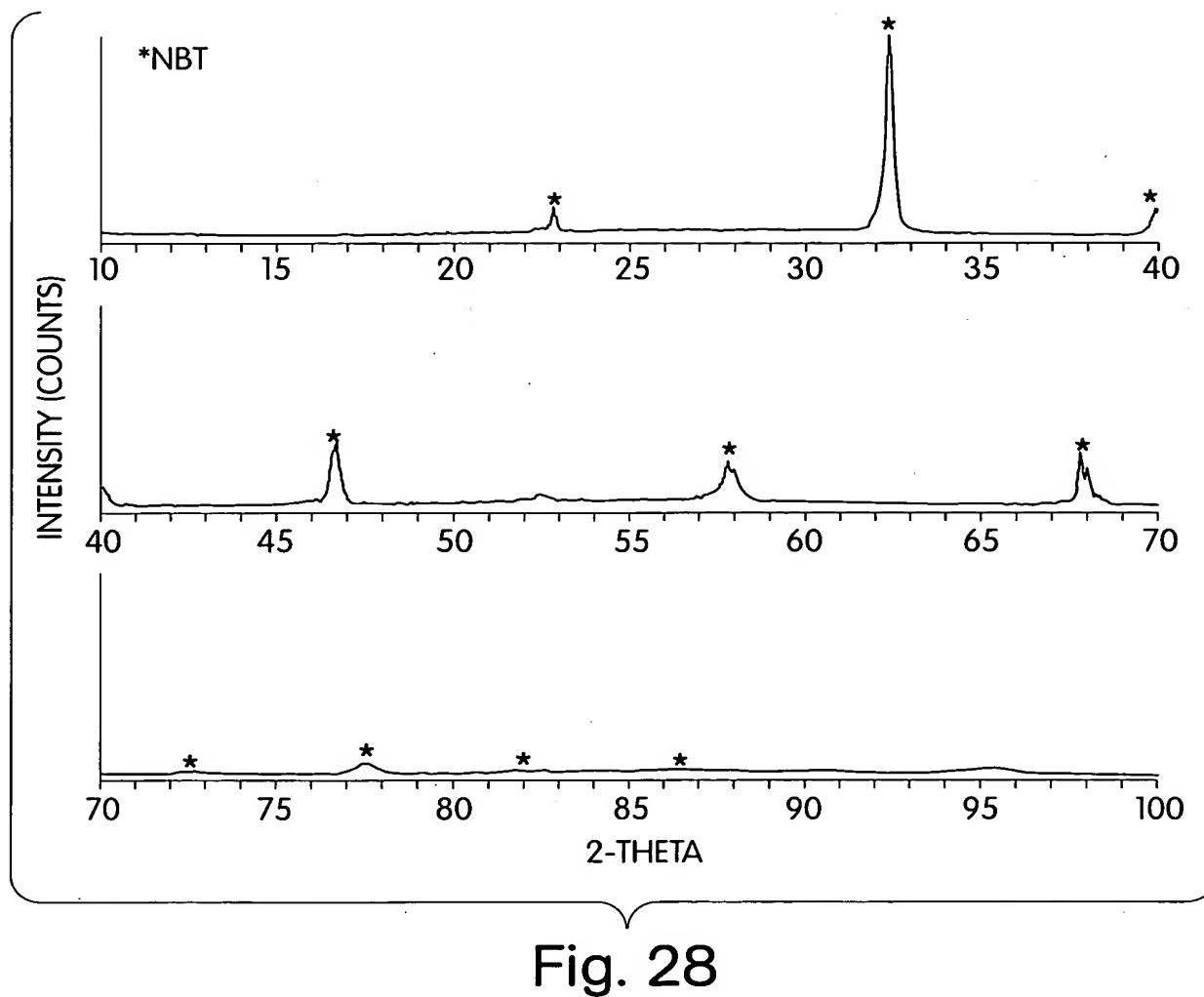


Fig. 27

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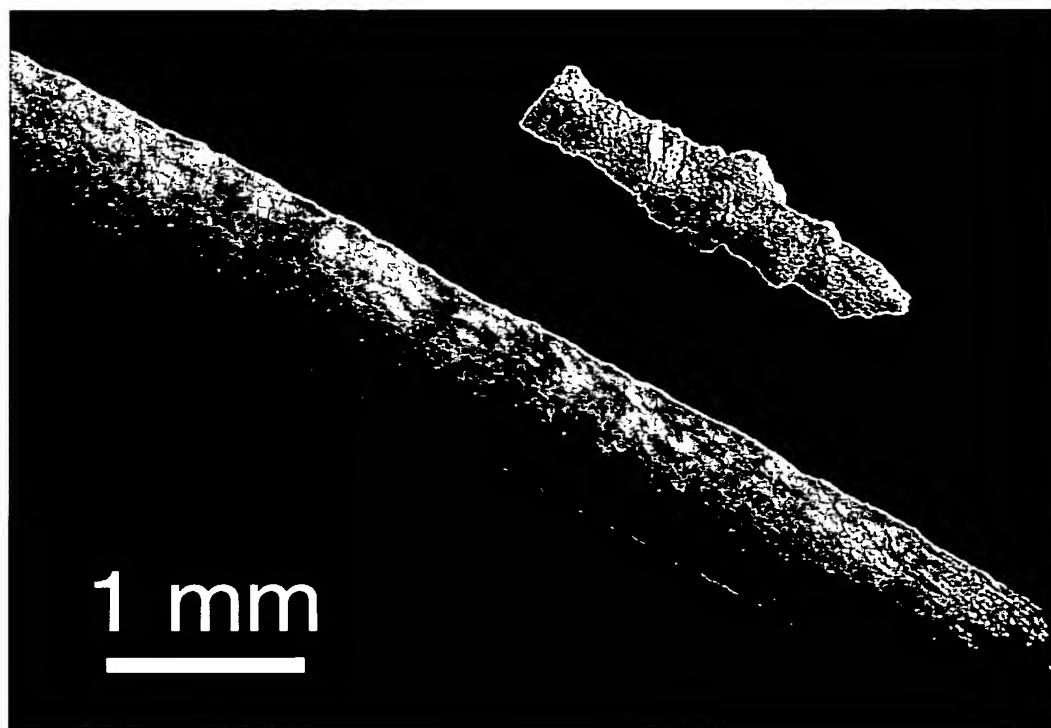


Fig. 29

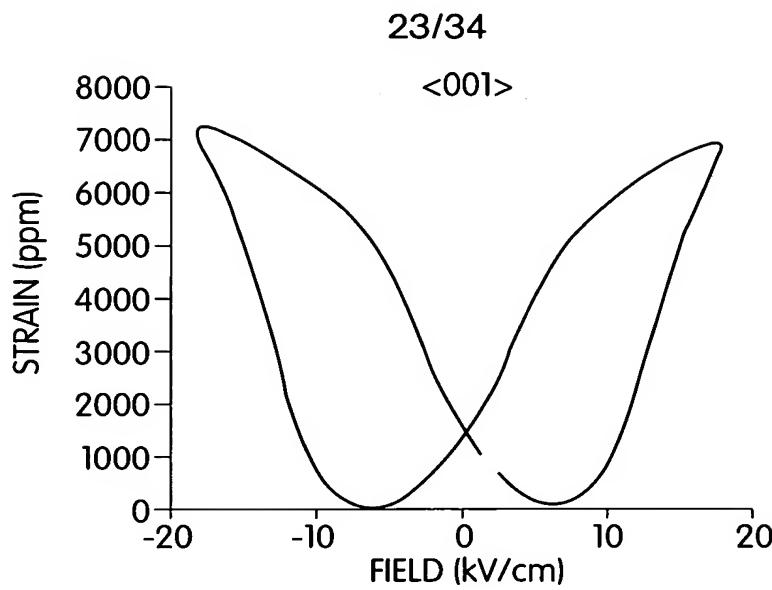


Fig. 30A

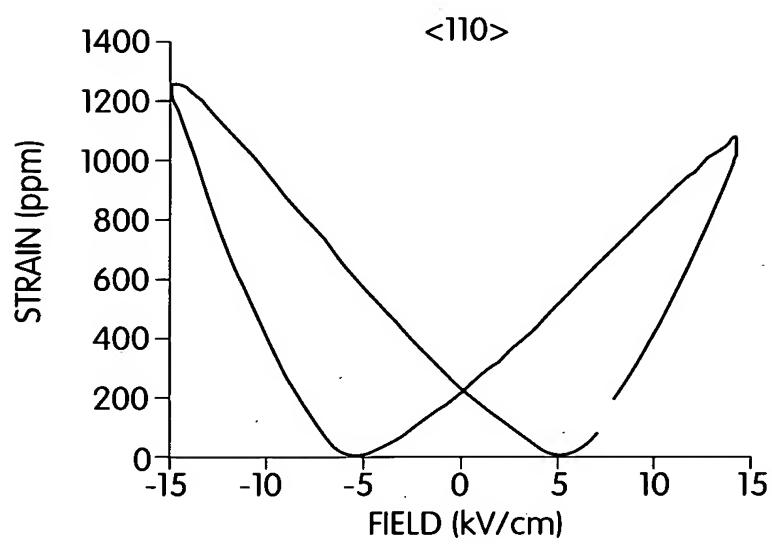


Fig. 30B

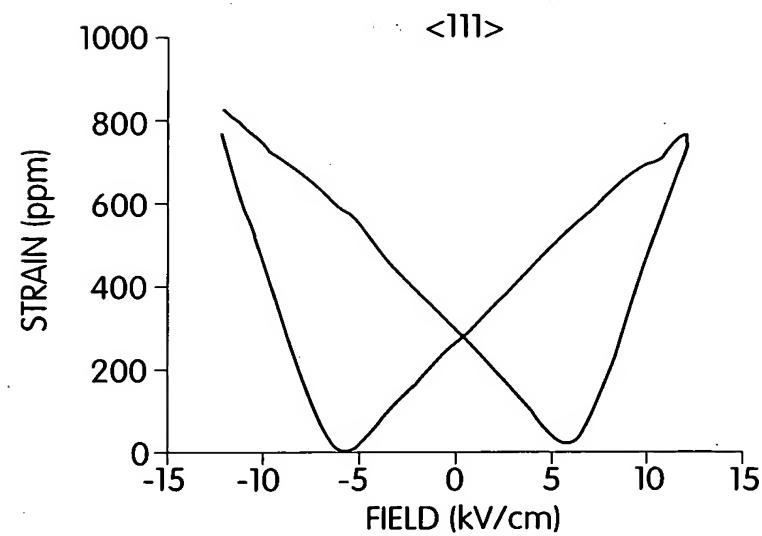


Fig. 30C

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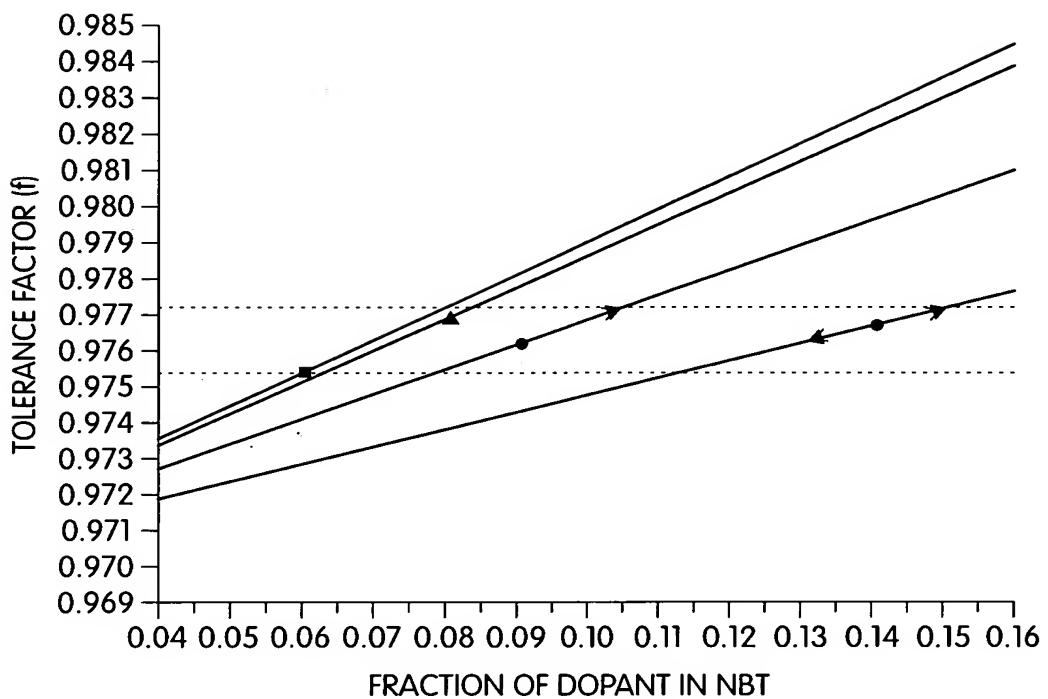


Fig. 31

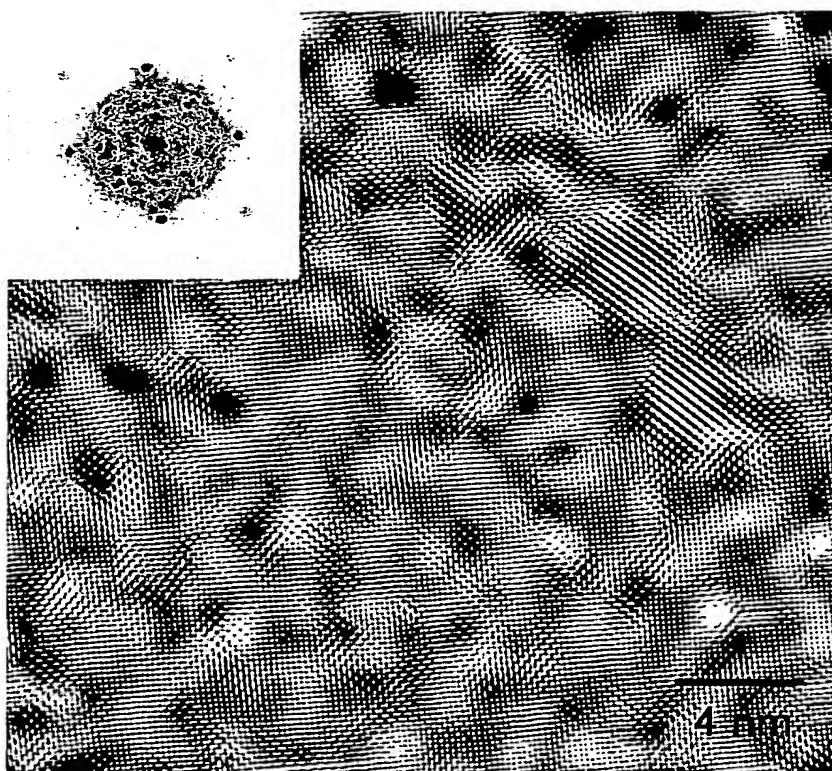


Fig. 32

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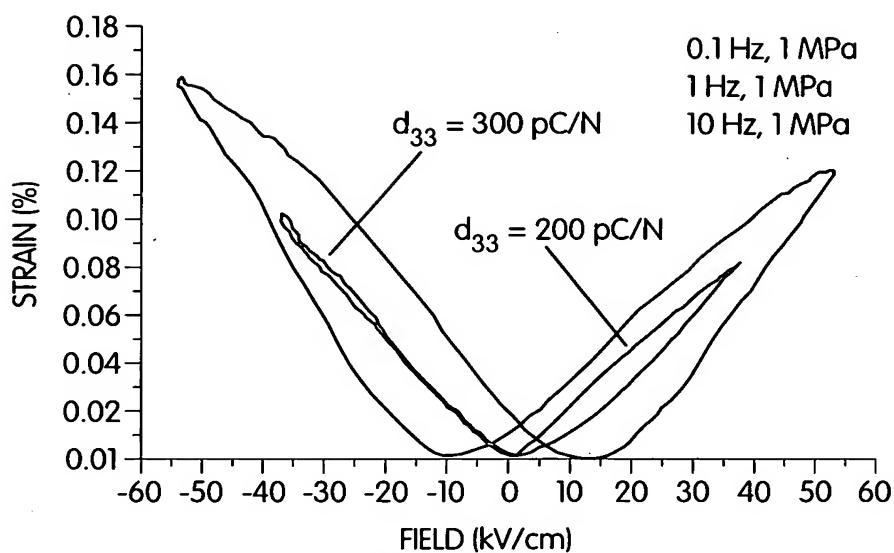


Fig. 33A

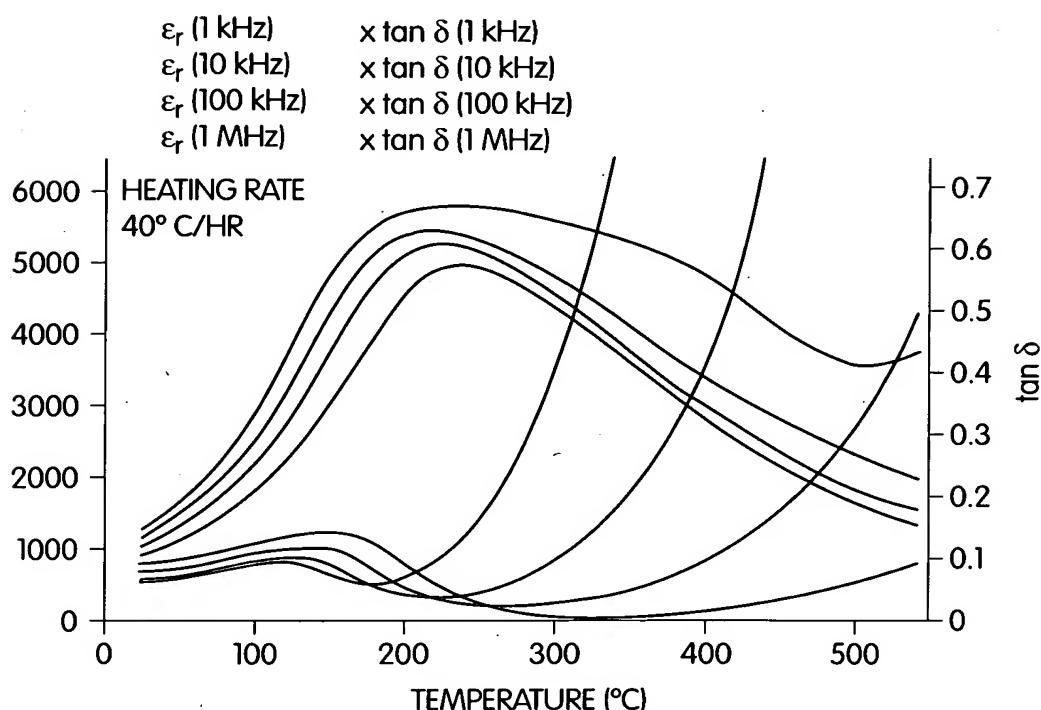


Fig. 33C

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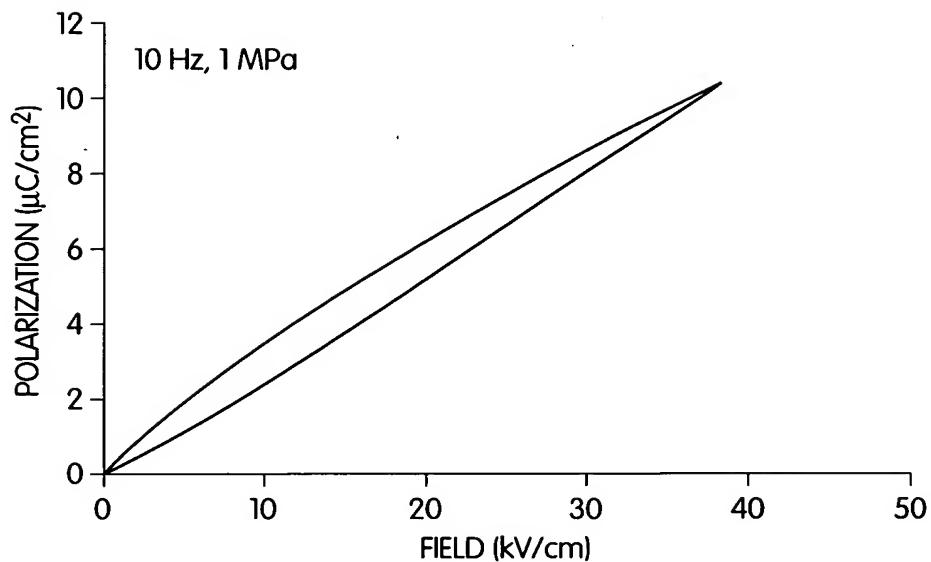
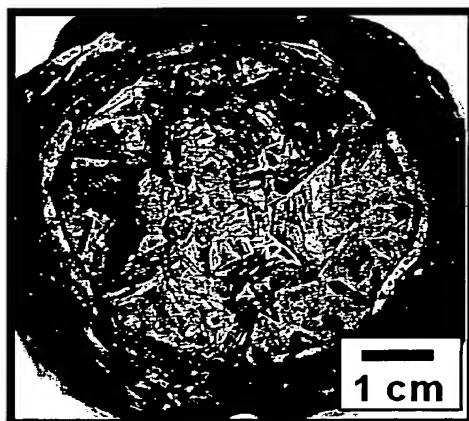
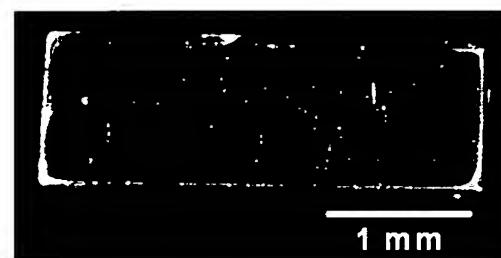


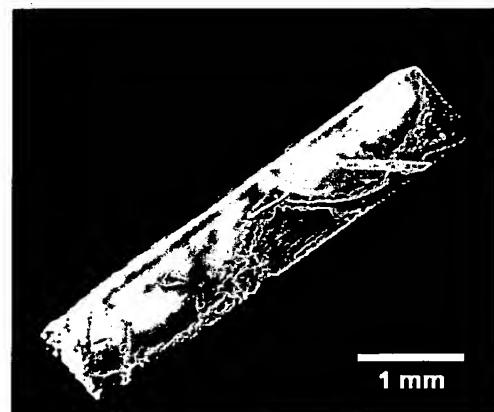
Fig. 33B



AS-GROWN
Fig. 34A



CUT AND POLISHED
Fig. 34B



CROSSED-POLARIZED LIGHT
Fig. 34C

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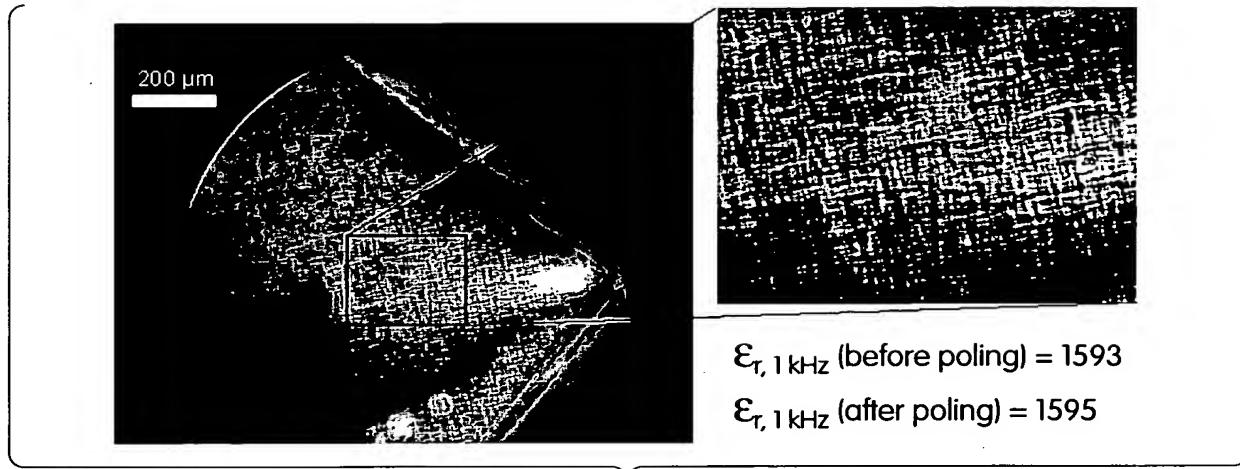


Fig. 34D

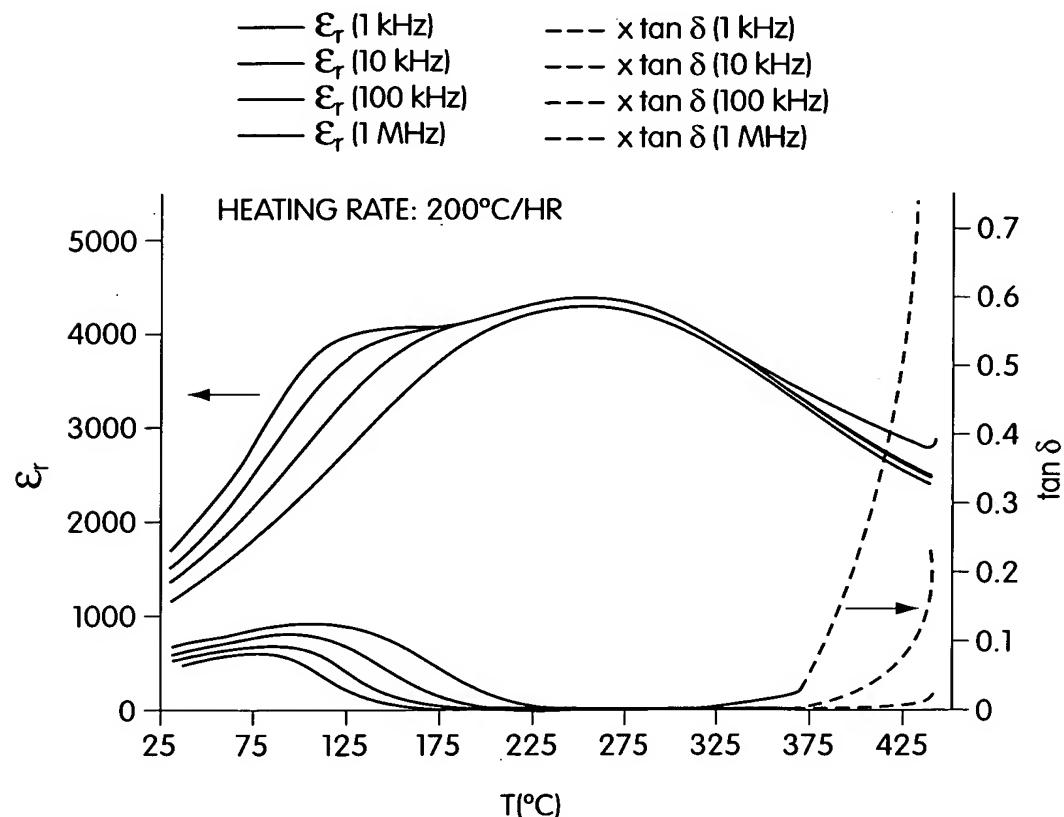


Fig. 35

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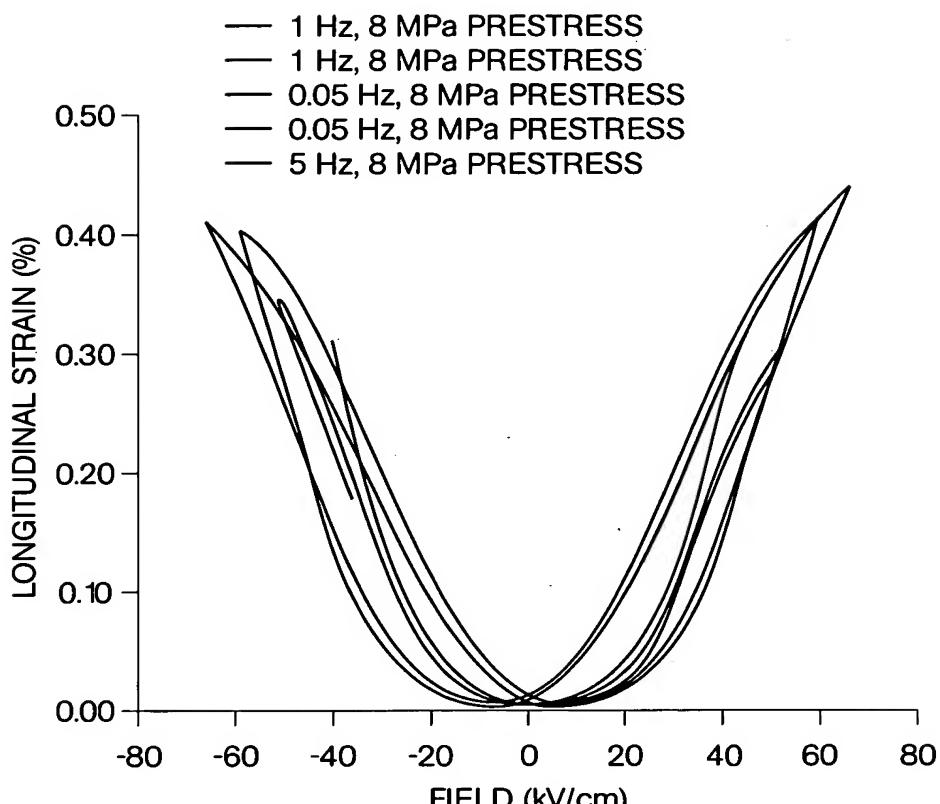


Fig. 36A

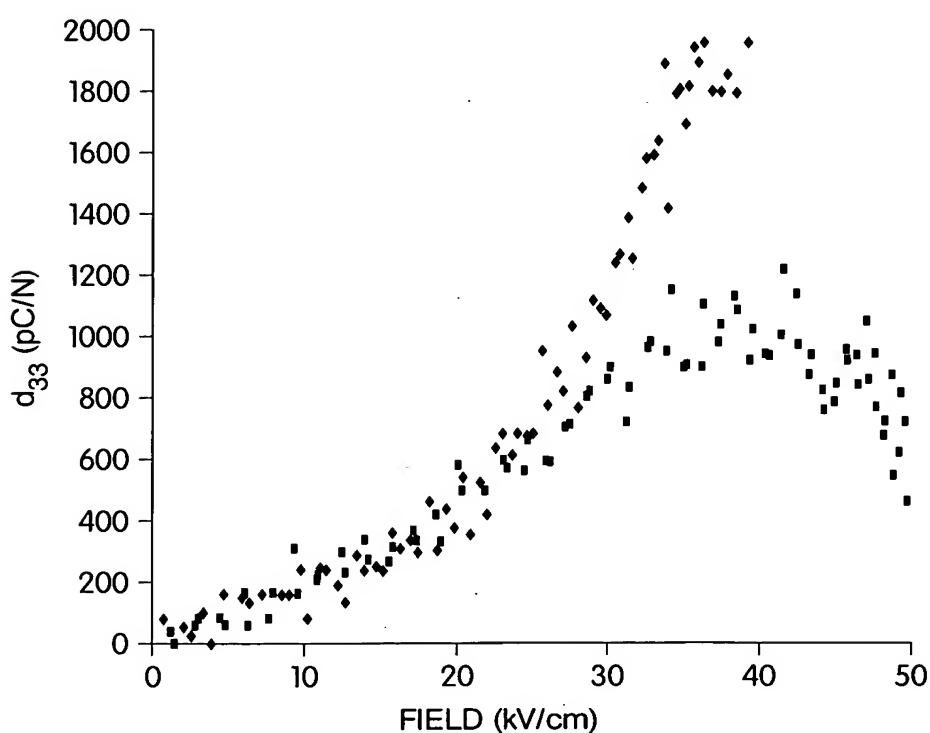


Fig. 36B

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NBT- χ BT-3NBZ							
mol%Ba	4%	6%	8%	10%	12%	14%	
Phase	FF _R	FF _R (PE → FE)	PE _T	PE _T (PE → FE)	FF _T (PE → FE)	FE _T	
T _m -0.5 Hz (°C)	119	95	87	90	93	128	
Bipolar Field							
Max Bipolar Strain	0.17% at 49 kV/cm	0.28% at 60 kV/cm	0.15% at 49 kV/cm	0.24% at 53 kV/cm	0.26% at 55 kV/cm	0.28% at 49 kV/cm	
Unipolar Field							
Max Unipolar Strain	0.08% at 47 kV/cm	0.31% at 73 kV/cm	0.13% at 73 kV/cm	0.21% at 49 kV/cm	0.25% at 53 kV/cm	0.14% at 45 kV/cm	
d ₃₃ (pC/N)	170	190 (high field)	---	---	315 (low field)	310	
Max d ₃₃ (PE actuation)	---	450 (low field)	500	725	460 (low field)	---	
Q ₁₁ [C ² /m ⁴]	---	1.8 (low field)	1.4	1.9	1.8 (low field)	---	
Polarization	E _c = 31 kV/cm						
P _{max} (C/cm ²)	P _{max} = 37; P _r = 26	36	33	36	41	P _{max} = 49; P _r = 21	
Current							

Fig. 37

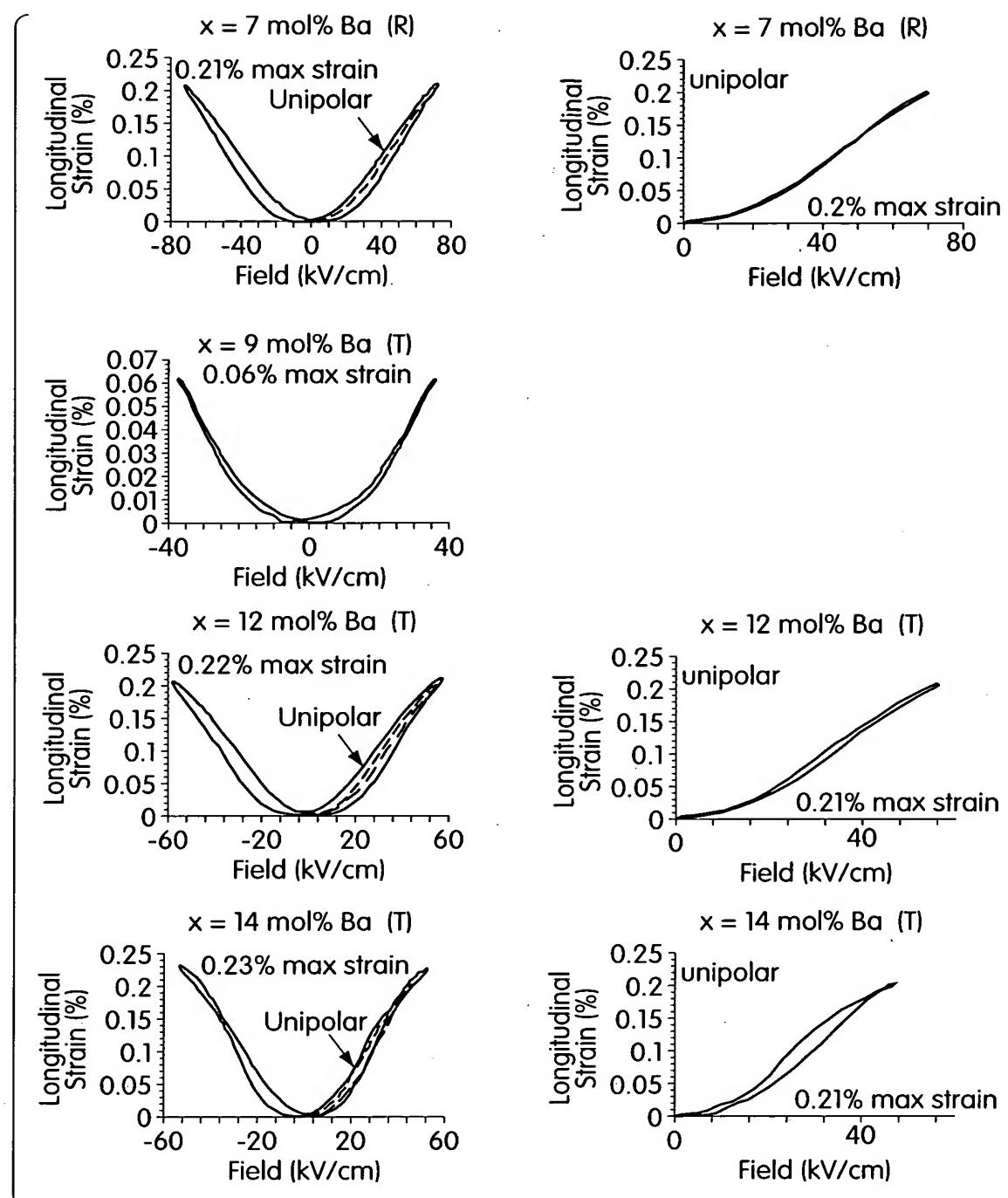


Fig. 38

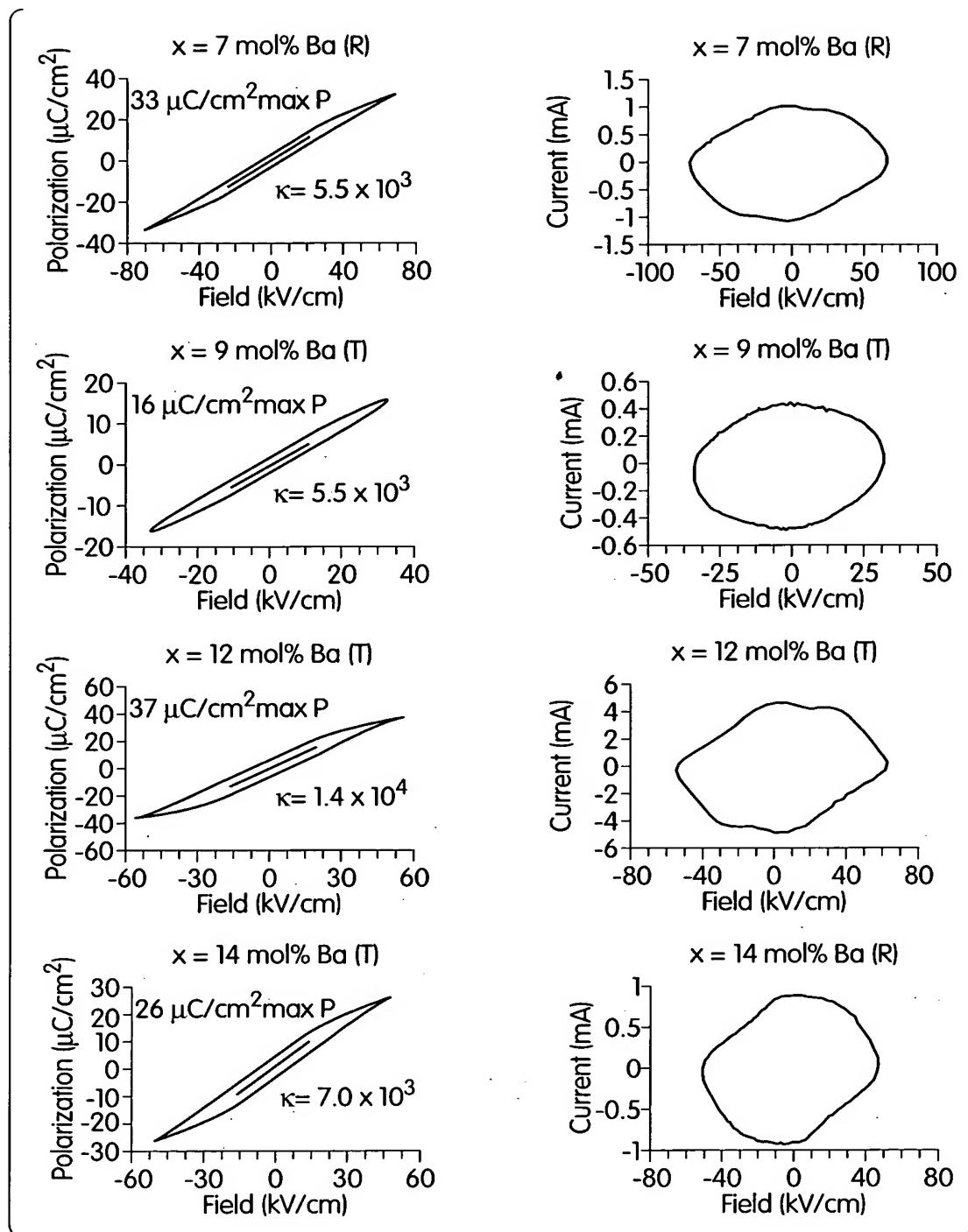


Fig. 39

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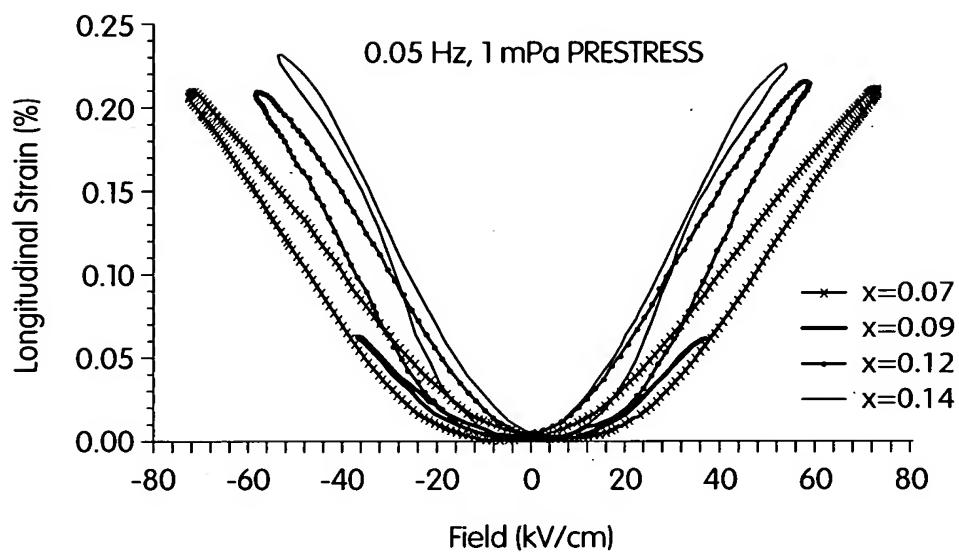


Fig. 40A

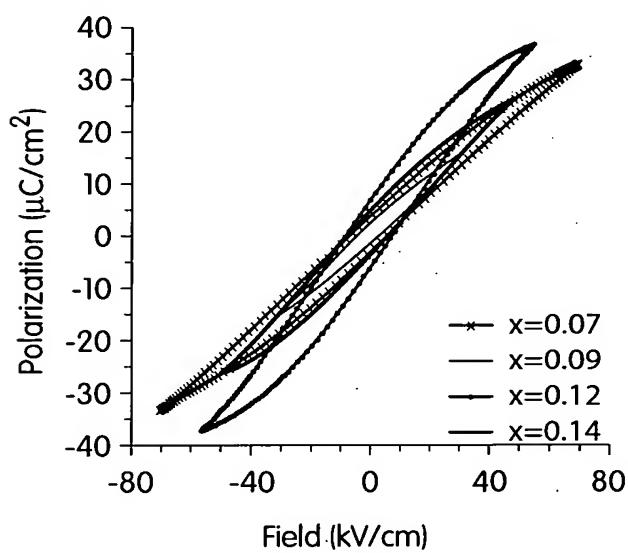


Fig. 40B

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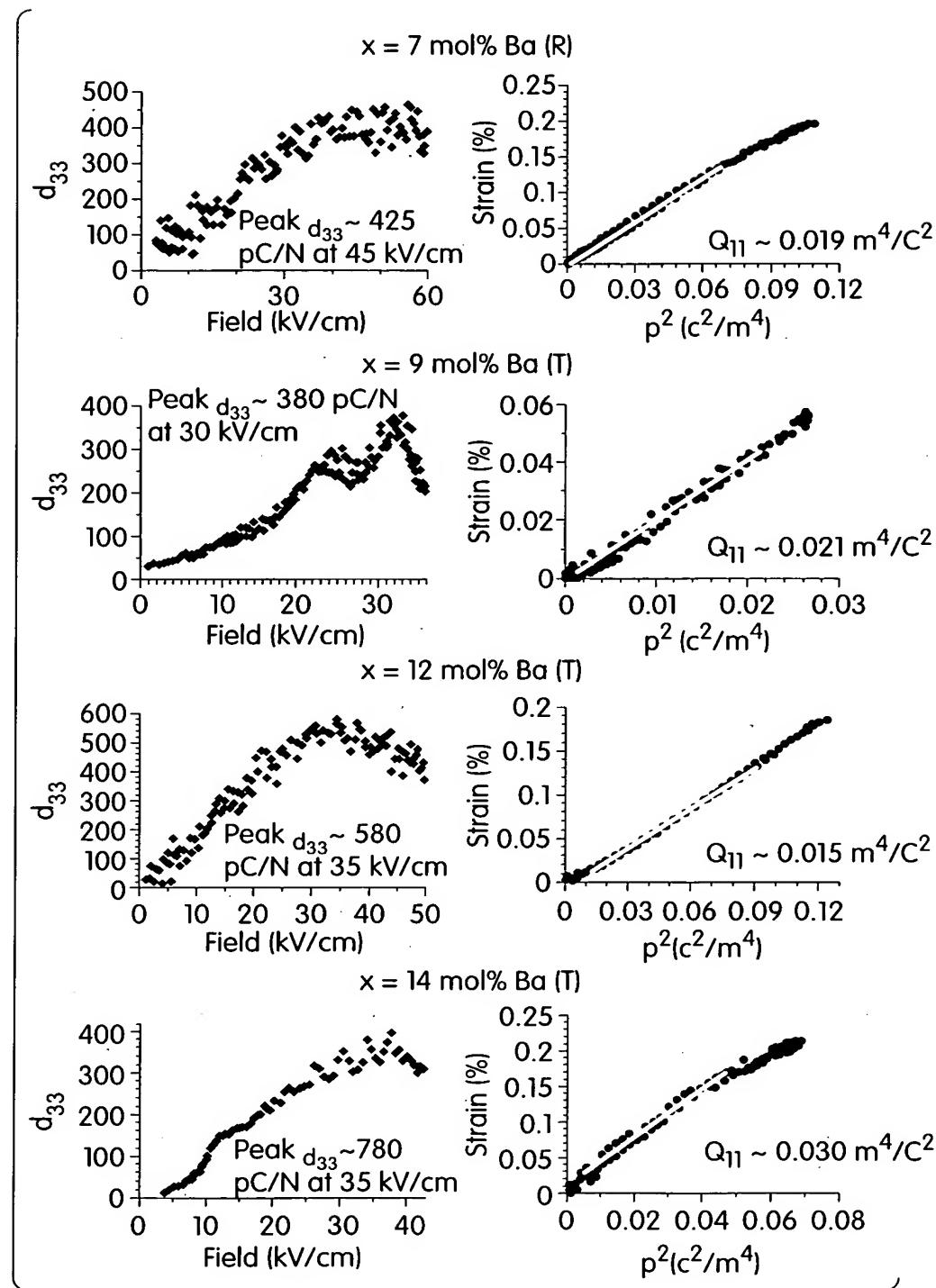


Fig. 41

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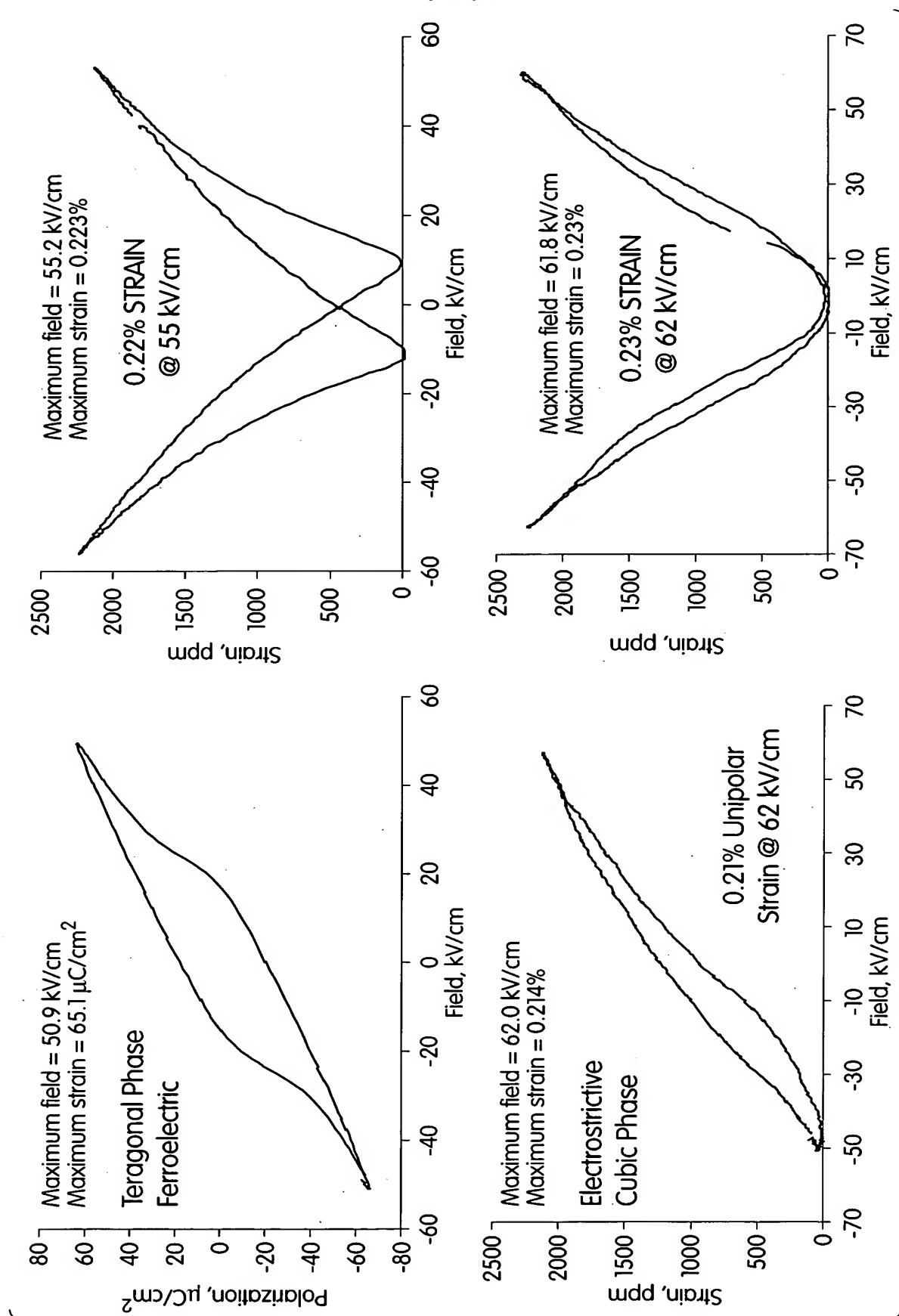


Fig. 42